

In the claims:

Please amend the claims as reflected in the following listing.

1-87. (Canceled)

88. (new) A method of enhancing quality of a planar image acquired by a detector in single photon emission imaging of a portion of a body or at least one specific organ or volume of interest located within the portion of the body, the portion of the body administered with radio-pharmaceutical substance radiating gamma rays, ,the method comprising:

selecting, for each pixel of the acquired planar image at least one selected distance from the detector, forming a set of effective distances, said set having at least one effective distance;

calculating, for each pixel, weight values utilizing acceptance angles of the gamma camera detector and the said at least one selected distance of the set of effective distances;

constructing a two dimensional image of a spatial distribution of the pharmaceutical substance within the portion of the body by mathematically analyzing said data in conjunction with the weight values.

89. (new) The method of Claim 88 wherein the step of calculating weights values takes into account the probability of a photon to be attenuated within the body.

90. (new) The method of Claim 88 wherein the step of calculating weights values takes into account Compton scattering within the body of the patient

91. (new) The method of Claim 88, wherein mathematically analyzing said data is done using an iterative algorithm.

92. (new) The method of Claim 88, wherein said at least one selected distance of the set of effective distances is selected utilizing *a priori* knowledge of human anatomy.

93. (new) The method of Claim 88, wherein said at least one selected distance of the set of effective distances is selected utilizing information relevant to the patient.

94. (new) The method of Claim 88, wherein said at least one selected distance of the set of effective distances is selected utilizing single photon emission image taken from another detector position.

95. (new) The method of Claim 88, wherein said at least one selected distance of the set of effective distances is selected utilizing a medical imaging modality other than single photon emission imaging.

96. (new) The method of claim 88 wherein said data comprises data obtained from a plurality of views, and wherein at least two views are acquired using dissimilar collimators.

97. (new) The method of Claim 88, wherein the set of effective distances, or a portion thereof, defines a plane.

98. (new) The method of Claim 88, wherein the set of effective distances, or a portion thereof, defines a curved surface.

99. (new) The method of Claim 88, wherein the detector is adapted to detect emitted photons having incident angles in the range of 0 to more than 5 degrees.

100. (new) The method of Claim 88 wherein said analysis comprises the steps of:

- (a) dividing an area of the detector facing the body into M bins;
- (b) dividing the portion of the body into N voxels;

- (c) providing a set of values D_i (wherein $i = 1, \dots, M$) reflective of the number of photons acquired by each bin;
- (d) constructing a matrix P having matrix elements P_{ij} of weight values of the voxels of the portion of the body (wherein $i = 1, \dots, M$ and $j = 1, \dots, N$), the matrix P setting a relation between each bin of the detector and each voxel of the portion of the body;
- (e) modeling a relation between said set of values D_i and a set of voxel values V_j corresponding to a selected distance from the set of effective distances and deriving said set of voxel values V_j of said image.

101. (new) The method of claim 100 wherein at least two of said bins are of unequal size.

102. (new) The method of claim 100 wherein at least two of said voxels are of unequal size.

103. (new) The method of claim 100 wherein dimensions of said bins are unequal to the dimensions of pixels in the obtained image.

104. (new) The method of claim 88 further comprising obtaining a plurality of planar images each utilizing a different set of weights.

105. (new) The method of claim 104 wherein at least two obtained images are combined to form a single image.